**WHAT ARE THE PRACTICAL SOURCES OF ENERGY?**

The practical sources of energy include the fossil fuels, natural gas, petroleum (or oil), and coal. Fossil fuels are referred to as nonrenewable energy sources because, once used, they are gone.

Scientists are exploring the practicality of other sources called renewable energy sources. These include sun, wind, geothermal, water, and biomass. The renewable energy resources are important in long range energy planning because they will not be depleted.

*Natural Gas*

Sometimes natural gas is confused with gasoline, the fuel in cars. They are not the same. Gasoline is a mixture of liquids, and natural gas is mainly methane and is piped into homes and office buildings where it is used as an energy source for heating, cooking washing, and drying. It is raw material to make other chemicals, and is the cleanest bumming fossil fuel. This means it contributes little environmental pollutants when bummed.

*Petroleum or Oil*

This is the black, thick liquid pumped from below the earth's surface wherever you see an oil rig. To make it useful, it is refined. Refining separates the gasoline portion which is used in transportation. Products from the remaining portions include synthetic rubber, detergents, fertilizers, textiles, paints, and pharmaceuticals.

*Coal*

Coal is the most abundant fossil fuel. It is not a widely used energy source due to the cost of mining and its impurities, which cause pollution (acid rain). There are two ways to mine coal; underground mining and strip mining. Disadvantage to these methods is the environmental change caused in the process. New ways of using coal are being explored, such as liquefication, in which a product similar to oil is produced.

*Solar*

The sun is 93 million miles away and yet, this ball of hot gases is the primary source of all energy on earth. In the hi ugh temperature of the sun, small atoms of hydrogen are fused, that is, the centers of the two atoms are combined. Fusion releases far greater energy than splitting the atom (fission, see below). Without sunlight, fossil fuels could never have existed. The sun is the supplier of energy which runs the water cycle. The uneven heating of the earth produces wind energy. Solar energy can be used to cook food, heat water and generate electricity. It remains the cleanest energy source an it is renewable. It is the hope for the energy source of the future and scientists at NREL are actively working on ways for solar energy to supply more our energy needs!

*Wind*

The unequal heating of the earth's surface by the sun produces wind energy, which can be converted into mechanical and electrical energy. For a long time, the energy of wind has been to drive pumps. Today windmills can be connected to electric generators to turn the wind's motion energy into electrical energy, and wind over 8 miles per hour can be used to generate electricity .It is a renewable, but unpredictable, energy source.

REACT --Page 7*Wood*

Wood provides U .S. homes and industries as much power as nuclear plants. Burning is the major global source of carbon dioxide in the atmosphere. Worldwide, wood is poor man's oil, providing 50-60% of the people with the barest energy necessities. Roughly half of the earth's forests have disappeared since 1950. Wood is considered a renewable energy source.

*Hydroelectric (Falling Water)*

When water is collected behind dams on large rivers, it provides a source of energy for the production of electricity. The enormous power of falling water is capable of turning giant turbines. These turbines drive the generators, which produce electricity. The degree of power is determined by the amount of water and the distance it falls. Hydroelectric power plants do not cause pollution, but there are fewer and fewer places to build dams. The environmental problem arises because a dam is typically built on a river creating a lake where land once stood. Water is a renewable energy source.

*Ocean Tides*

Ocean tides are very powerful forces. To harness the rising and falling of the tides would be an expensive process, but it would be a very important future source for Eastern United States. Perhaps underwater windmills or floating generating stations could utilize this potential energy source to produce electricity.

*Geothermal*

Geothermal energy refers to the energy deep within the earth. It shows itself in the fountains of boiling water and steam known as geysers. Geothermal energy was generated by the decay of natural radioactive materials within the earth. In addition it is the heat energy remaining within the earth from gravitational formation of the earth. This energy source is not popular in the United States, but Yellowstone has some geysers. Geothermal energy is used to heat some homes, greenhouses, and factories. The actual usable geothermal sites are few, but is considered a renewable energy source.

*Biomass*

This is garbage! As bacteria decomposes organic waste such as manure, septic tank sludge, food scraps, pond- bottom muck, etc., methane is produced. This methane is the same as natural gas from the ground. There are power plants in the United States, which use methane derived from these organic wastes (mainly manure). Some cities produce electricity by burning garbage in especially designed power plants.

*Nuclear Fission*

This is splitting of the uranium atom. In the 1930's scientists found that splitting the nucleus of an uranium atom releases a tremendous amount of heat energy. This knowledge was used to make atom bombs. Today, power companies use the heat produced by nuclear fission to produce electricity. Some people think nuclear energy should be our main source of future energy. Other people feel that the dangers are too great from radioactive waste products, meltdowns, and radiation exposure of workers.

Currently the nonrenewable resources supply the majority of our energy needs because we have designed ways to transform their energy on a large scale to meet consumer needs. Regardless of the source of energy, the energy contained in the source is changed into a more useful form -electricity Electricity is sometimes referred to as a secondary energy source. All the other sources are primary.

In summary, energy sources can be classified as renewable or nonrenewable: ENERGY

Renewable

1. sun 2. water 3. wood

4. wind 5. biomass 6. geothermal

7. ocean tides

Nonrenewable

1. coal 2. natural gas 3. petroleum 4. nuclear fission

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